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ENERGY IMPACTS ON THE HEALTH CARE SYSTEM

Summary of Conferences

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES • Public Health Service • Health Resources Administration

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FOREWORD

During the latter part of 1979, and continuing through mid-1980, the Bureau of Health Facilities, Division of Energy Policy and Programs, conducted six conferences on energy contingency planning for health care facilities. The combined attendance at these conferences was 250 individuals, representing hospitals, governments, and health and energy businesses and associations in almost every one of our nation's 50 States. They shared with us and with each other, important thoughts, data, developments, and observations on the future of different components of our health care system as they would be changed by the escalating prices and uncertain availability of energy and fuel in the coming decades. At the conclusion of all but one conference, we prepared a summary of the presentations, and the conclusions reached in work sessions. The report of the first seminar, held September 20-21, 1979 in Washington, D.C., was published earlier this year (available as publication HRA 80-14512.) However, as the theme of this conference was repeated at the other five sites throughout the U.S., different perceptions of common problems emerged. Based on this conference feedback and our own continuing concerns about energy and health futures, we concluded that summaries of each conference should be disseminated as widely as possible. This publication incorporates the proceedings of the conferences held in Boston, December 10-11, 1979; Atlanta, February 28-29, 1980; Denver, March 28-29, 1980; and Chicago, June 26-27, 1980.

Of course, the true success of these conferences cannot be measured now. It will be measured in the future, and it will be measured in terms of this nation's continued ability to provide health care, under increasingly difficult conditions. Those conditions will be marked by rapidly rising oil and gas prices, increasing uncertainty in obtaining adequate oil supplies from oil exporting nations; mounting inflationary pressures throughout the entire economy that are, in large part, a symptom of higher energy costs; and the ability of health care decision makers to cope with this energy induced economic transition. To the extent that these conferences made health decision makers more aware of the problem, brought to their attention a need to change policies and priorities, and succeeded in identifying related transitionary management skills, that is and will be the true measure of their effectiveness.

Florence B. Fiori, Dr. P.H.
Director,
Bureau of Health Facilities

Burt Kline
Director,
Division of Energy Policy and Programs

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BOSTON, MASSACHUSETTS

December 10-11, 1979

Defining and planning for energy and health contingencies in the New England area was the charge given to the Boston conferees by Chairman John Quigley, Secretary of the New England Hospital Assembly. Quigley then turned the conference over to Burt Kline, Director of the Division of Energy Policy and Programs, Bureau of Health Facilities, for a keynote presentation on the energy situation in general.

In his overview, Kline pointed out that the energy related problems foreseen over the past several years are now at our doorstep and that they require immediate and collective action. Many of the problems to be resolved are beyond the reach of individual facilities and organizations.

Internationally, petroleum production and export of the OPEC nations will go downward since the pressure of developing nationalism in those nations contributes to conservation of their oil resources. As Kline observed, "it no longer matters whether OPEC remains united or breaks up, a sellers market has been established and petroleum prices will remain high."

These international pressures will result in an energy-short future during which health's energy priorities will be lowered. If we manage effectively, the 1980s will be a decade of opportunity. However, Kline warned if adequate fuel supplies exist this winter, and lull New England into continued inaction, the energy problems of the future will overwhelm us.

Panel Presentations

The Boston conference was organized around three panel presentations. The following summary identifies the panel members and moderator, highlights the overall presentations without identifying the individual speaker.

I. Assessment of Energy Cost & Supply Impacts on Health Facilities & Health Care Delivery in New England

Moderator: Gilliat Burnham, Hospital Association of New York

Panel: J. Leo Cronin, Northeast Petroleum
James R. Smith, New England Power Planning
Richard Leighton, Maine Hospital Association

Reductions in oil exports for 1980 represent the loss of 20 tanker ships per day - each holding 225,000 barrels of oil. Hand in hand with the reduced inflow, is a decreased consumption level. In New England, during the winter of 79-80, gasoline distributors received up to 80 percent of their 1977 allocations, while consumption stood at 65 percent of 1977 levels. This conservation makes gasoline rationing a less likely possibility.

Conservation efforts in New England have been successful in the private sector, though largely ignored by the public sector, including hospitals. According to delivery records of Northeast Petroleum, the private sector in New England has cut oil consumption by 32 percent since 1974; the public sector has saved practically nothing.

Gasoline rationing is not a new idea. During World War II, it worked backed by a strong commitment for a nation of 23 million vehicles. Now, with 140 million vehicles and less national cohesiveness, rationing may be difficult to enforce.

Hospitals must be aware that rising fuel prices reduce credit availability. At present price levels, it costs a fuel distributor 55¢ per day per barrel to carry accounts. Hospitals normally wait 90-100 days to pay for fuel, and the distributors are not able to get bank credit on these accounts. Hospitals should heed this message and be aware that the future will bring intense competition for fuel oil supply.

Electrical utilities reported to the conference that even with constrained economic growth through the 1980's, electric power generating capacity may be strained by 1990. According to 10-year projections, reserve generating capacity in New England, which is now at 28 percent, will fall to 20 percent. That level does not provide sufficient protection for equipment maintenance and unexpected breakdowns. Thus, the prediction is that rolling blackouts will occur.

Expansion plans for electrical utilities include new petroleum fuel generating plants, hydroelectric (which could add up to 500 megawatts by the year 2000), and co-generation, solar, biomass and other "esoterics" which could add up to 750 megawatts by 1990 if proposed plants are approved without excessive delay. Coal-fired plants can be brought on line more quickly than nuclear, though in the

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past nuclear has offered the least cost delivery. However, in New England, one of two coal fired plants was recently turned down. The other is expected to be operating in 1987. Over 30 plants are being reviewed for conversion to coal but some do not have adequate surrounding acreage for plant wastes.

New England electric utilities are hoping however, to turn increasingly to coal in order to reduce dependency on oil. Currently, 56 percent of electric power generation in the New England area is oil fired. Plans exist to reduce this dependency to 33 percent by 1990.

Conferees were advised that the practical use of electric heat as an alternative for hospitals is not promising unless effective storage devices are incorporated into the facility. A ceramic brick heat storage device is now being tested in New England.

The point was made that Maine and North Dakota are the two States which are entirely dependent on fossil fuels. Recognizing that fact, the Maine Hospital Association and the Blue Cross Association conducted energy audits of 35 Maine facilities in December 1978. As a result, hospital energy consumption has been reduced 15 percent.

The Maine Hospital Association is working in other areas to aid State facilities in energy. They have negotiated fuel and plant supply contracts on a Statewide basis to cut costs, and are encouraging electric. The association is also alerting facilities to the effects of an energy shortfall and how to plan for such an event. Some actions recently recommended: close wings or buildings; transfer patients; close nonessential services (elective surgery) and offer cold meals; reduce laundry loads, ventilation, visitor access, and lighting; and finally, use substitute fuels, for example, wood and waste.

Some additional facts concerning energy allocation were made in the panel's summation: (1) New England oil allocation plans do not provide priorities for health facilities; (2) the New England State's emergency plans do not address health services needs. It was recommended that the region have a representative body to develop and advocate basic energy emergency need.

II. New England Energy Options

Moderator: Chaim Gold, New Jersey State Department of Health

Panel: Steve Colome, Harvard University
Frank Kuszpa, Danbury Hospital
Phillip Drew, A.D. Little, Inc.
Nancy Alexander, Energy Unlimited

Panalists drew an overall energy picture of the New England area. They pointed out that the region was 80 percent dependent on petroleum, versus 47 percent nationally. Of that petroleum supply, 79 percent is imported, which translates into a 64 percent dependency rate on imported fuel. The result is a 20 percent higher cost of energy than the rest of the nation.

The picture will not look much different at the turn of the century. If the overall growth rate of the New England area is about 1.5 percent a year, and there is an intensive conservation effort coordinated with development of alternate energy sources, New England will still be 47 percent oil dependent in the year 2000. Regulatory reform is needed to encourage co-generation and establish conservation standards.

The New England Energy Congress (NEEC) exists to discuss some of the energy problems and implement regional energy plans. The panel pointed out that there are no health representatives in this Congress, and though no health interests have volunteered to participate, there is room for health input on NEEC recommendations being made now on energy to the New England Caucus.

The panel discussed a particular application of solar energy. This is located at Danbury Hospital in Connecticut. The Danbury system uses 12,000 square feet of collectors at various locations. These are tied with a 42,000 gallon heat storage tank (water) and is simple and reliable to operate. The system has three valves, four pumps, and plant staff can tell how it is operating just by looking.

Solar is viable in New England since the sun shines 56 percent of the time. At the Danbury Hospital, the solar unit was originally estimated to cost $600,000 but that was a low estimate because of rapidly rising costs. If the total system had been installed as originally planned, construction costs would have exceeded $1 million.

The panel discussion pointed out that if projected solar installations involve extensive building modifications, installation may not appear attractive. Solar decisions must be weighed against potential fuel cutbacks or loss of other energy forms.

The projected 20 year payback period for the Danbury installation has *not* been shortened by the energy price increases of the past year since other costs have also risen. However, the unit cost of solar energy is very favorable when compared with electricity.

Experiences with co-generation were discussed next by the panel which pointed out that the Public Utilities Policy Act of 1978 required utilities to allow co-generation after January 1, 1980. States are required to establish rules governing purchases of co-generated power.

Efficiency of co-generation systems is high, up to 65 percent, compared to 35 percent for large electric generating plants. Since co-generation systems require a steady demand for the electric power to be generated, large hospi-

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tals as well as many State and institutional buildings would qualify.

Massachusetts is developing financial incentives and fuel priorities to encourage development of co-generation systems. The State of New Jersey has established special financial sources which aid co-generation system developers. Also, in New Jersey a recent study estimated the rate of return of co-generation at the 500 megawatts production level, to be 25 percent. That was before the Iranian situation which caused subsequent price increases. Even though equipment and installation costs are high, payback appears to be in the 5 to 7 year range.

The panel summarized energy options, recognizing that the greatest obstacle to hospital consideration of energy efficiency is the present Medicaid/Medicare reimbursement which allows energy operating costs to be passed through. The panel recommended that facilities consider passive solar applications. As for diesel exhausts, the panel said that they do provide a high temperature source for water heating, but the high nitrogen oxide output may exceed EPA standards under some weather conditions.

III Energy Contingency Planning

Moderator: Matt H. Spear, Division of Energy Policy & Programs, BHF

Panel: Jorge Lopez, Michigan Blue Cross/Blue Shield Association
Francis Danaher, Hartford Office of Civil Preparedness
Andrea Simoneau, Massachusetts Office of State Health Planning
George Neal, IBM, Vermont

This panel focused on four specific examples of energy contingency planning as potential models for others to follow.

1. Michigan

The Blue Cross/Blue Shield Association of Michigan, and the Michigan Health Planning Offices are developing a State-wide energy program for the health facility sector. The health planning agency structure includes eight regional Health Systems Agencies that provide planning and review services affecting health services delivery.

In Michigan, the 224 hospitals have a high dependency on various fossil fuels for heating and cooling; 48 percent are totally dependent on those fuel sources. The Michigan Energy Contingency Planning Program notes that the energy required to support the State's health services must be treated as a source of increasing costs, and a potential cause of service inhibition when shortfalls occur.

Planning activities in Hartford, the panel pointed out, had good opportunities for district heating systems, but appear to have limited potential for other solutions. Even when hospitals carry out good emergency planning, they often fail to coordinate them, or have them incorporated with State and municipal planning. Unless health leaders take part in public preparedness planning, State emergency planning overlooks health facilities and related needs.

Massachusetts poses a different picture. There, the Massachusetts Hospital Association has become active in energy contingency planning, and is working with the Massachusetts Office of Energy Resources (MOER) to advance planning on behalf of the State's health service delivery complex.

In 1978, a hospital task force was formed to advise the MOER on administration of the hospital provisions of the National Energy Act (NEA). This group is already involved in energy conservation issues which go beyond NEA. In addition to the NEA grant activities, the panel observed that other incentives are needed to increase energy conservation. These incentives exist in the Determination of Need (DoN) and Rate Setting Commission (RSC) programs. Although RSC does not have a mechanism to actively encourage hospitals to seek energy conservation savings, it could, observed the panel, be coordinated with DoN activities to bring about significant and quick energy savings in health facilities. Conservation activities in hospitals do not require large expenditures and can result in savings of 15 to 20 percent through preventive maintenance and efficient operations.

The energy contingency planning underway at IBM's Burlington, Vermont plant was outlined for conferees. The company has drafted a plan which identifies specific actions that will be taken to accommodate to two levels of energy supply reductions. The plan includes alternative employment of staff, and describes *what* will be done, *how* it will be done, and by *whom*. Planning ahead has allowed IBM to test its plans before events make it necessary to implement the steps. Emergency responses have been carefully charted, and specific responsibilities have been assigned throughout the plant.

At the conclusion of the conference, a summary of major points was given.

- Health facilities have generally been slow to initiate energy conservation programs. They are behind other sectors in energy management experience, and are in greater jeopardy than others in their weaker capacity to respond to severe and widespread energy related contingencies.
- Health facilities must plan in coordination with State municipalities so that there are no conflicts, and must plan with nearby institutions and firms so that local resources can be shared and joint alternative energy production systems can be developed.

ATLANTA, GEORGIA

February 28-29, 1980

Jointly sponsored by
Bureau of Health Facilities
National Alliance for Energy
Contingency Planning for Health Resources

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The importance of energy conservation, and the necessity of grass-roots planning were among the themes that emerged at the Atlanta conference. Energy and utility speakers gave background data on energy supply as well as outlook for the cost and supply futures of energy.

Hal Miller, Vice President for Marketing, Transcontinental Gas Pipeline Corporation, based in Houston, Texas, said that government policy is the most important factor affecting price and availability of gas. It is difficult to say what an eventual national energy plan will be like according to Miller. The 1977 plan was essentially an all electric plan, directing a phase-out of gas and oil, with coal and nuclear planned for electricity generation. Miller said the plan was unrealistic since there was no way to produce that much coal or nuclear power. In 1978, another national energy plan was developed. More of a political compromise, this plan spread the risk. It provided for conservation and increased production, two very important features.

The Natural Gas Policy Act provided for phased deregulation of new gas. By 1985, not all gas will be deregulated, just that discovered subsequent to April 1977. The Act has provided for deregulation of certain classifications of gas, and thus has had a tremendous beneficial impact on drilling for *new* gas. However, said Miller, right now there *is* a natural gas shortage.

In the 1980's, there will be no long term bargains on gas prices. However, gas is a domestic resource and Miller observed, "If I were planning for a long term energy supply for a new facility, I would certainly give an awful lot of consideration to a domestic source, versus an imported source."

By 1985 under full deregulation, there will be a decreasing supply of gas. However, the gas industry is undertaking a concerted effort to develop synthetics, such as methane. "I realistically expect that we will have five synfuel plants operating 10 years from now," Miller said, though he added that this was his assessment, and that the industry predicts that there will be 20 such plants operating within 10 years. Each plant, says Miller, will cost between $2 and $2½ billion, a staggering amount of needed capital. Five coal gas plants would produce about half a trillion BTUs, which means we will continue to need imports from Canada and Mexico. However, he, said, we must learn not to depend too heavily on any one import source.

There are 26 trillion feet of proven natural gas resources in Alaska. The gas will be the most expensive available, but it is domestic and it is needed. The free market may not accept the prices charged for Alaskan gas, and Miller said in his opinion, Alaskan gas will end up as a government financed project.

Miller concluded that availability and price of imports are in need of consistent, long-term government policy, not the present short-term expedient measures.

In a question and answer session following Miller's presentation, the observation was made that capital required for building coal conversion plants would be more than the $2.5 billion Miller cited, since his figure did not include the impact of interest rates. Interest rates would mean added costs of more than $7 per million BTUs. In response, Miller observed that the Federal Government will have to support (through loan guarantees or interest subsidies) such capital outlay. Over the long run, he said, such plants will provide economical, competitive sources of fuels, but the problem is in raising capital.

The next speaker to address current energy initiatives involving health facilities was *Charles Winn*, Senior Power Engineer, Tennessee Valley Authority (TVA). Winn is also Chairman of the Energy Commission of the National Electrical Reliability Council (NERC), an organization interested in adequacy and reliability of electrical systems.

The generating capacity proposed for addition to the electrical industry for the next 10 years is largely coal and nuclear, with a couple of oil-fired units. Winn and others in the industry are concerned that much of this proposed generating capacity is not under construction. Considering that the lead time (planning, licensing) is 10 years for coal and 14 years for nuclear, and that construction is a lengthy process, it is likely that many generating plants will not make the present schedule. The only optimistic note, ac-

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cording to Winn, is that the electricity demand also is not meeting the projected levels on increase.

Winn was also concerned about capital costs needed to expand electrical production, but pointed out other possibilities which must be considered in contingency planning: disrupted fuel supplies; mandated shut-down of nuclear units; cut off of coal supplies during strikes.

Considering the uncertainties of our energy future, Winn said that conservation becomes a more and more interesting topic. He discussed TVA's commercial and industrial energy conservation program, which involves hospitals, as well as factories and other businesses. TVA will conduct audits and recommend how and what is needed to conserve energy usage. Winn concluded that there is great potential in hospitals for conservation of energy. TVA has recommended a formal program for conservation in hospitals, including energy audits, energy reduction goals, and close monitoring of consumption of energy. TVA has surveyed four hospitals and surveys of six others are underway. Those surveys show that a 30 percent energy savings is possible. Winn said that hospitals are a fertile field for conservation, and he urged conference attendees to ask for such an audit, and to develop an energy conservation plan for their facility.

In response to a question from the audience, Winn gave the following figures on the breakdown within the 30 percent energy savings shown possible by TVA audits:

- 45-65 percent savings in heating, cooling & ventilation systems
- 8-15 percent in laundry
- 10-20 percent in lighting, remainder in equipment, sterilization, and other areas.

In the largest hospitals, Winn said cogeneration would be an attractive energy source, particularly for facilities producing above 30-50,000 pounds of steam an hour.

Winn also observed that utilities have identified health care facilities as an important segment. Hospitals should, however, discuss such possibilities as rotating blackouts with their local utilities, including how plans are drawn and the steps taken to continue service to high priority users.

The next speaker, *Grid Toland*, from Chevron, cautioned that there are no total solutions on a regional basis, since energy problems are national and global. As background, Toland traced the growth in the U.S. demand for oil.

In 1980, 20 million barrels of oil a day is required; 15 percent of this total is for #2 oil, for residential and commercial use. The demand for #2 oil is relatively stable, and its predicted growth will continue at the rate of 1 percent a year. In the southeast, since 1976 demand for #2 oil has declined by 2-2½ percent a year. Only 5 percent of new homes in the southeast use #2 oil, and by 1990, the figure should decline to only 1 percent because of conversions to electric and gas, and some conversions to solar and wood.

Transportation uses 55 percent of the total oil consumed, with gasoline accounting for almost 75 percent of that total. Demand in this sector has grown to its current level of over 10 million barrels a day. This category includes oil for aviation fuel and diesel for cars and agriculture. Significantly, demand for gasoline is declining. Toland believes demand for motor gas consumption has already peaked and will decline 2½ percent a year until 1990. This is not just a factor of cost, but is because of more efficient vehicles.

Total oil requirements from 1983 to 1990 are predicted to grow at 10 percent a year. Continuing conservation, Toland said, should ease any major supply problems over the short-term, though the uncertainty of supply continues to exist.

Domestic oil production peaked early in the 70's, and has been declining ever since. If we are going to meet demand, says Toland, we have to have large supplies of imported oil—enough to meet almost one-half of our needs. Unless we cut consumption, or increase domestic production, or find alternatives to oil, there will be great uncertainty in our oil future.

Toland pointed out to the conference that, "In planning for health facilities and energy, you are looking at planning for unanticipated interruption of supply." Oil won't run out all at once, but the price of getting oil out of the ground will go up since it will be found in smaller fields, and in more hostile geographic environments.

Toland pointed out that this nation cannot tolerate our present level of oil imports. We must conserve, reduce demand, and develop heating alternatives. New homes are using gas and electric. Wood and solar are becoming a significant fuel in the southeast. For example, the equivalent of 130,000 barrels of oil a day comes from wood (biomass) in the southeast. In the east, 2,000 barrels of oil equivalent a day is coming from solar, and Toland predicted that by 1990, that figure will be 13,000 and by the year 2000, 2 percent of our energy will come from solar. Gasahol is another opportunity to get away from fossil fuels.

The next speaker, *Art Waycaster*, Director of Intergovernmental Programs for the Southern States Energy Board, directed remarks to the increased use of alternate energy sources.

Our dependence on imported oil has grown dramatically. In 1960, the U.S. was 19 percent dependent on foreign sources. In 1974, the year the Arab embargo ended, the U.S. was 38 percent dependent. In 1979, our import oil bill stood at more than $200 million a day. Alternate energy sources can play a major role in reducing this bill,

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said Waycaster, but it isn't going to happen quickly, it isn't going to be cheap, and we will be dependent upon petroleum products for many years to come regardless of cost.

According to Waycaster, the southeast's principal energy resources are coal, nuclear, hydro-power, and solar (which includes biomass or wood energy).

In the seven southeastern States, known recoverable coal reserves are estimated at 25,420 million short tons. Coal must play a key role in the area's energy future, though it will bring serious health, safety, and environmental problems which must be confronted.

Of the 71 nuclear generating facilities in the U.S., 19 are located in the seven southeastern States; 34 more are in some state of construction. However, Waycaster said that there will be some slippage in that construction and probably not all of these plants will be brought on line. Despite the national debate about nuclear power, he said he could see no viable alternate to some dependence on nuclear power for electricity in the immediate future.

The southeast uses only 30 percent of its large hydroelectric potential. However, Waycaster pointed out that hydroelectric generation requires vast amounts of water held in storage, and we must be willing to accept the subsequent land losses and other environmental impacts.

Solar energy has great potential. If every U.S. building used solar for space and water heating, we would immediately reduce our present oil use by 21 percent. Solar heating has been used in the southeast for at least four decades. However, solar heating and cooling is expensive and will remain so. Some experts warn that solar space heating may not be competitive even by the year 2020. Other restraints on solar are caused by population distribution; 73 percent of the U.S. population lives in urban areas which means shadowing by taller buildings and less roof area per residence. Also, it is much more expensive to retrofit existing buildings for solar heating than to design new buildings.

One form of solar energy, biomass, does have significant potential for immediate short term applications. In Georgia, officials estimate that conversion of existing facilities to wood energy would reduce the State's dependence on other energy sources by 25 percent.

Biomass could extend to transportation, which consumes 31 percent of the oil used in the U.S. today. Available gas supplies could be extended by adding methanol or ethanol to produce gasahol. Even a 90-10 mixture used in all cars would reduce oil consumption by almost 300,000 barrels per day. At today's prices, that's $7.5 million a day.

These alternative energy sources are being made commercially attractive by rising costs of petroleum. Converting to a wood-fired boiler in a hospital, at a cost of $1 to 2 million, doesn't look quite so adventuresome now that the price of petroleum products threatens to go completely off the board.

Predicting that hospital energy costs will continue to rise, Waycaster encouraged the health sector to make known its support for energy policies that will improve reliance on domestic energy sources, and cautioned that there are some tough issues which will not be easy to solve.

Richard Maturi brought the energy contingency problems more specifically into the health sector. Maturi is with the Blue Cross/Blue Shield (BC/BS) Program in Chicago, Illinois, and introduced his comments with the caution that since the Plans are autonomous and widely varying organizations, different Plans must use different strategies to support effective health care energy management.

The Blues are concerned with the impact of rising energy prices on the cost of health care for its subscribers. Maturi said that in 1979, Plan subscribers' health care costs increased, conservatively, "$25 million for the southeast region and $259 million nationwide—solely as a result of increases in the prices of fuels and utilities. Roughly speaking, every 1 percent increase in health care institution fuel and utility prices this year will cost Blue Cross/Blue Shield Plan subscribers $1.5 million in the southeast region and $7.5 million nationwide."

However, beyond the increased cost, Maturi said the Blues are vitally concerned with energy's potential impact on their 83 million subscribers. Disruptions in the operation of health care institutions caused by acute or extended shortages of hospital energy supplies, gasoline, or health care supplies derived from fossil fuels could compromise access to quality health care for Blue Cross/Blue Shield subscribers.

Maturi said that about 20 Plans are actively involved in energy activities. Energy conservation activities will eventually be overshadowed by rising energy prices, nor will energy conservation alone fully address the threat of fossil fuel shortages to health care operations. Therefore, Maturi said the Plans are also studying activities that go beyond these initial efforts. These include:

(1) *Energy Management Information Systems*

Once an energy audit or technical assistance program has been initiated, there is an opportunity to establish an ongoing system at the community or State level to provide health care institutions and other interests with information to document energy needs and energy conservation accomplishments, and to plan special energy contingency planning programs. Blue Cross/Blue Shield of Greater New York is now implementing such a system in cooperation with the Hospital Association of New York State and New York State Energy Office.

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(2) *Capital Investment*

Maturi said he thought that energy management capital will soon become an important issue for the Plans to explore. Energy conservation capital investments may reduce health care institution energy consumption by 15 percent —after low cost operations and maintenance savings have been achieved. More critically, renewable or plentiful sources of energy will require enormous amounts of capital. Maturi cited efforts such as the Bureau of Health Facilities' solar demonstration program and the Department of Energy matching grants program, as providing an initial stimulus for conversion projects, but observed that "We're going to need more special government assistance programs, greater access to conventional philanthropic capital, and more conventional debt capital to finance conversion projects as the technologies develop."

Though Maturi said that t - special contributions that Blue Cross Plans and Blue Shield Plans may be able to make in the capital investment area are not yet clear, a demonstration program is being conducted by Blue Cross of Greater Philadelphia, the Delaware Valley Hospital Council, and the Health Care Financing Administration to systematically identify and evaluate capital investment opportunities in Philadelphia area hospitals. The project's next phase will be to explore a cooperative approach to get the cost-effective capital projects implemented.

Maturi identified several areas that the plans need to investigate, including:

(1) *System Adjustments to Energy Shortages*

The Plans need to insure that payment systems can respond to the financial implications of temporary or extended energy shortages. For example, Maturi said that if an acute energy shortage requires patients to be temporarily shifted among institutions, payment systems must be able to respond to the shift in variable patient care costs among institutions, while insuring that the continuing fixed costs are adequately financed. This requires development of a more sophisticated understanding of the meaning of occupancy and utilization related to short and long term energy curtailments.

(2) *Ongoing Maintenance of Institutional Energy*

Techniques are needed to insure that achieved energy conservation does not deteriorate over time.

(3) *Joint Purchasing of Health Care Energy Supplies*, such as fuel oil, needs to be examined, as well as the roles the Plans can play to support such programs.

The next speaker, *Lamar Priester, Ph.D.*, Executive Director, Division of Energy Resources, Columbia, South Carolina, cautioned conference participants that they could not "look entirely to the Federal Government to solve these problems for you. Basically, it has to be solved by you on the firing line."

Dr. Priester pointed out some specific considerations for the health care system as it begins contingency planning. During the last 2 years, the combination of cost containment efforts and the development of alternatives like home health care, combined to move the health care system as a whole from dependence on #2 oil to a gasoline basis. Yet, gasoline is the most competitive energy area. Those hospitals with home health services must consider conservation, including fewer trips and good mileage cars. Patient and staff transportation systems must be considered.

Never before in our history have we experienced the degree of uncertainty on every single fuel type as we do today. Priester exorted hospitals to deal with that uncertainty and to diversify fuel sources, including the "little 1 and 2 percent energy sources which some have suggested here." Tapping geothermal, where you can, is good and innovative. The technology exists to harvest combustible waste in an environmentally acceptable way. For example, 15,000 to 20,000 pounds of steam an hour can be generated even by a small facility.

Wood is capable of delivering a significant amount of energy. In South Carolina alone there are 54 million tons of waste wood. However, Priester pointed out that even alternative sources of energy are becoming expensive. Waste wood has escalated in cost from $4 a ton 6 months ago to $12 a ton today.

The relation between energy and health will also extend to emergency planning. We must give specific attention to how to handle casualties or other medical problems arising from incidents at energy production facilities, from power plants to oil refiners. Priester said that synfuel plants will probably be more susceptible to accidents than nuclear power plants.

Coal, electrical, and nuclear—all have health implications. Synfuels pose new environmental contaminants since many of the chemicals used in synfuel production are active carcinogens. Increased coal usage will result in a marked increase in respiratory disease. Also, coal mining poses occupational hazards.

Priester concluded with the warning that "all anticipated innovations carry some health component. I must take issue with those who blithely put forward these innovations because they are 'benign'—there will be some health care impact. How serious they are, we will have to wait to find out, but I cannot think there are none."

Kaye Lasater, Director of Public Relations of the North Carolina Hospital Association, delivered remarks on behalf of Marilyn Braun, Coordinator, Emergency Assistance

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Agency, Civil Preparedness Agency, Greensboro-Guilford County, North Carolina.

Lasater outlined the activities involved in a successful revamping of the Emergency Management Assistance Agency as it related to the medical community. Agency activities directed to hospitals include: (1) dissemination of periodic information on energy grant opportunities; (2) inclusion in any agency analysis which would affect hospitals, such as gas rationing proposals; (3) establishment of an information/communication system, organized out of the city's Public Safety Office, to communicate directly with hospitals and their safety directors in the event of any threat of civil disturbances in the community.

Lasater gave a specific example of how the agency has acted as a facilitator and coordinator, using the issue of radiation detection. Testing radiation detection equipment, correcting extremely serious deficiencies in that equipment, and involving State, city fire, county fire, emergency medical services, environmental health, city police, industry, and consumer advocates were only some of the reasons for the success of the radiation project. The Agency is currently training all line personnel in the county on radiation, and believes that the resulting knowledge on the part of hospitals about radiation and the coordination with the radiation teams, will be invaluable in the event of any local radiation emergency.

The potential impact of oil shortages on plastic medical supplies was addressed briefly by *Charles Wagner*, staffer with the Division of Energy Policy and Programs. In his remarks, Wagner credited Lt. Col. Gary B. Clark, M.D., United States Army, with bringing the medical plastics problem to the attention of the health care field.

Clark has pointed out that only 0.2 percent of the oil consumed in the U.S. goes to the plastic medical supplies industry. However, those products have become all pervasive in the treatment of patients. For example, of about 630 major line categories in the Federal Medical Supply catalog, about 50 are made of various classes of plastic and about 70 percent of those are intended to be disposable items.

Clark researched the plastic medical supplies as affected by the 1973-74 oil embargo. During that 6-month embargo, there was no overwhelming shortage because the Food and Drug Administration has ordered a 9-month stockpile of plastic feedstock to be established. This was in contrast to the British situation where there was no stockpile, and resulting supply difficulty. Examining what would have happened in this country if the embargo had lasted long enough to exhaust the stockpile, Clark asked manufacturers of plastic medical syringes what would happen should plastic supplies cease. Of the largest manufacturers, 50 percent said they would have to revert to glass, but only one could re-tool for such a production change. Clark also discovered that there had been actual delays of 5 to 20 weeks in the delivery of plastic feedstock to these manufacturers; still, no planning for contingencies exists. Disaster in the form of disappearance of needed plastic medical supplies was averted, said Wagner, "not because of any planning by the industry, the health facilities, or the government, but because the end of the oil embargo came in the nick of time."

The situation is not improving. The General Accounting Office has begun a concerted effort to delete plastic items from the war reserve inventory because of their supposed commercial availability. Colonel Clark warns that this growing philosphy of reducing plastic equipment stockpiles and relying on commercial market availability is likely to be very dangerous. These supplies may be non-existent if there is a new oil embargo, a national crisis, or if allocation plans are instituted which do not recognize the dependency of modern medicine on key plastic items.

Work Groups

On the second day of the conference, four work groups met to discuss specific actions that would be taken by health facilities in order to be prepared for an energy-short future. Major recommendations are summarized below:

- Facilities must maintain contact with fuel suppliers (both primary and secondary) to see about continued secondary supplies.

- Hospitals should plan for possible "brown outs" of 5 - 15 volt decreases. Hospital engineers should keep staff informed of the impact of such a decrease on various hospital systems. Through ongoing relation with suppliers, hospitals should try to get advance notice of possible power reductions.

- A plan for distribution of energy resources to health facilities should be established for use in possible blackouts. Such plans should be established between the State Health Planning and Development Agencies, the State Health Coordinating Councils and the State Energy Commissioners.

- Plans should be developed for possible evacuation in event of region-wide energy failures. Included in these plans should be legal assistance from the American Bar Association for ways to reduce court cases in event of such mass transfers. Interstate transfers of patients should be established through State Emergency Medical Systems.

- Establish incentives to incorporate energy conservation in each hospital through changes in reimbursement programs of both Blue Cross/Blue Shield and the Health Care Financing Administration.

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- Establish energy contingency requirements for health facility management in the areas of physical plant, delivery of services, reimbursement, and regulatory concerns.
- One individual should be specifically identified for contingency planning and be involved with all hospital departments.
- Plan alternative health care transportation which would respond to both long term and acute gas shortages. Plan for hospital van- or car-pools and work with the regional transit authorities, on the State level, to facilitate patient and employee transportation in acute situations.
- Secure gas supplies by establishing gas storage at the institution; contracting with local gas stations; or make arrangements with schools or other systems which already have allocation systems. All these approaches would require State approval.
- Consider institution operations from the view of energy requirements. For example, look at hiring and staffing patterns in terms of location of workers relative to facility. Investigate flexible work hour arrangements.
- Investigate possible changes in delivery of service, such as shifting patient loads as appropriate, and use of satellite clinics for meeting primary care needs.
- The Bureau of Health Facilities should recommend to the health planners, that statewide emergency energy or gas shortage plans be developed, with full input from public/private sectors, to investigate situations such as those raised during the workshops.
- In conservation and conversion planning, both Federal and State energy groups and government agencies should provide guidelines and some technical assistance.

DENVER, COLORADO

March 28-29, 1980

Sponsored by the
Bureau of Health Facilities
The National Alliance for
Energy Contingency Planning for Health Resources
The Western Governors' Policy Office

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The Denver meeting was organized along the same lines as the earlier Atlanta conference, with energy and health representatives speaking during the first day and conferees meeting in workshops the second day to discuss problems and formulate solutions.

The conference started with an overview of the energy problem presented by *Charles Bottinelli*, President, Energy Information Associates, Inc., of Denver. He pointed out that this country is entering an era of increasing cost and decreasing availability of energy, saddled with an enormous stock of energy-inefficient goods. Heavy powerful cars, factory buildings and equipment, homes with little or no insulation—all these capital goods are our legacy from a time of cheap and available fuel.

Energy demand has been increasing exponentially. Electrical demand in the U.S. has been increasing at about 7 percent per year until just recently. That means it is doubling approximately every 10 years. It also means that by 1990, in order to meet the doubling in electrical demand, we must double the number of boilers, generators, turbines, substations, relays, transmission cables, and even electric meters. And we must double again by 2000, just to keep up with demand. Consumption in each of the next 2 decades will be greater than all preceeding consumption of electricity since the beginning of the Industrial Revolution. And, says Bottinelli, we do not have enough metals and minerals to make all those extra boilers, generators, and substations, relays and cables. We could until the year 2000, but not after that.

Other somber energy facts were pointed out.

The oil-producing countries of the middle east consume very little petroleum. The world consumes about 20 billion barrels of oil per year. To maintain that rate of consumption while keeping reserves intact, would mean another Kuwait or Iran would have to be discovered every 3 years; another Texas or Alaska about every 6 months. Such discoveries are not likely.

About 50 percent of this country's imported oil is exported by nations which are "volatile" at worst, and "unstable" at best. We are increasingly vulnerable to import interruptions.

In this country, domestic reserves of petroleum are declining. The ratio of oil reserves to consumption in 1970 was about 6 years, a dangerously low level. With the discovery of oil in Alaska, our reserve ratio is still under 8 years.

Domestic production of natural gas peaked in 1973, and according to data released 2 years ago, we had 3 years of reserve. That means that without futher additions to reserves, we would be essentially out of domestic natural gas in the early 1980s.

Bottinelli disputed the often held our hope that domestic coal resources would, with proper technology, effectively replace petroleum. Coal production from 1979 to 1995 is projected to increase from 600 million short tons per year to about 1800 million short tons per year. However, using exponential growth curves against these production forecasts, our "vast" coal reserves mean:

(1) using high estimates of coal reserves, domestic coal will last only 52 years, at a modest 11 percent per year increase in production;

(2) using the low estimate of coal reserves, coal supply will last only 39 years.

Coal, as the energy source of the future, also has other problems associated with reclaiming and mining: land reclamation is expensive; there will be water and air pollution; there will be transportation difficulties; and there will be long lead times in equipment production and training of personnel.

Using reserve statistics, production forecasts, and increased rate of consumption, Bottinelli said that the U.S. oil barrel will run dry in 1983. That depletion time, as well as the others mentioned, is not necessarily a prediction of the future. The estimates are, according to Bottinelli, "reasonable first-order estimates of resource life expectancies under continuous growth conditions." Production and consumption curves will not increase exponentially; but at some future time, they will return to zero. Nonrenewable resources are just that.

After this gloomy warning, Bottinelli moved on to discuss alternate energy sources. Most such sources have limited potential he said. Nuclear fussion has an uncertain

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future; the industry is beset with major problems and in 1978 there were only two orders for nuclear construction.

Solar may have potential, but it is limited by economics until at least the year 2000. Nuclear fission at this point, is "pie in the sky."

Conservation is really the best short-term answer to our energy problems since it will extend the depletion time on the fosssil fuels and will buy time for energy research and development. Conservation in building is vitally important. According to an AIA study, "If existing buildings can save at least 30 percent and new buildings can be made 60 percent more energy efficient, by 1990 the U.S. would save the equivalent of 12.5 million barrels of oil per day." That would bridge the anticipated 1990 oil import gap.

Thus, like building management in all other areas, hospital and health care administrators and their engineering staff, must develop practical energy management programs to restructure patterns of energy use in the physical plant.

Bottinelli concluded his presentation with this post script: "There is no short term technological fix waiting to rescue us from our energy morass. It appears that for at least the next 20 years or so, we are going to have to rely on some of the more traditional energy fuels, plus a healthy dose of conservation." The 1979 Harvard Energy Project indicates that up to 30 percent of our annual energy demand could be saved through increased energy efficiency in the residential, industrial, and commercial sectors. Conservation is the best way to realize immediate, although partial, relief of our dependence on foreign energy."

Conferees next were introduced to the National Alliance, one of the co-sponsors of the conference. *Frederick Lund*, Director of the Western States Human Resources Board pointed out that the National Alliance for Energy Contingency Planning for Health Resources got off the ground due to the efforts of the Health Resources Administration, and its Bureau of Health Facilities. The Alliance, which embraces all components of the health and human services field, is dedicated to planning on a regional and national basis, for energy costs and supply emergencies in the health field. Lund asked that conferees keep the goals of the Alliance in mind as they continued their sessions.

Next on the agenda was *William J. Martin*, Manager of Electric Planning and Analysis, Public Service Company of Colorado. He told conferees that he recognized that administering a health care facility is a complex business, and energy supply is only one of the problems an administrator faces. However, he pointed out, supply and cost of energy make it a grave national problem which health care facility administrators must face.

Citing the interrelationships between price and the availability of adequate and reliable electric supply, Martin said, "Under the forces and laws that govern our economy, electric power will be available in abundant supply . . . only if your local power system is permitted to charge an adequate price." The outlook for the electrical industry is not good says Martin, for a number of reasons ranging from the effects of high rates of inflation on capital intensive facilities needed for production of electricity, to unresponsive government regulations. The Public Service Company of Colorado is an example of what has already happened to some utilities and what is going to happen to some others. Martin said, "We have not been permitted to charge enough for our electricity to pay for the costs of doing business. We are literally about to run out of cash to pay our bills." He urged attendees to support their local utility in requesting higher rates, since any other alternative is going to be even more costly.

Martin pointed out that the two major components of the price of electricity are: (1) the capital costs of the facility; and (2) the basic costs of energy that goes into that facility. Capital costs today are about $1,000 per kilowatt for building a generating plant. By 1990, that cost will have more than doubled, and by the year 2000 will have more than doubled again.

Putting a value on a kilowatt hour of electricity is difficult. How much, for example, would you (hospital administrators) pay for the electricity for the patient who is on a kidney dialysis machine, or for a person on the operating table. That is a difficult question to answer. However, for health care administrators, the single most important thing that can be done to control the electrical bill is to examine the way in which electricity is used, and then to consciously decide where, when and how much you want to use. Determine the value to your institution of a kilowatt hour for various kinds of uses. Having done that, then decide what you can do to conserve.

Tom Burns, with the Economics Department of Chevron, introduced his comments with the positive point that consumption is down because people in this country have gotten the message about energy, and are starting to do something about it. Burns cited oil consumption figures pointing out that delivery of oil is down 11.6 percent for the first 2 months of 1980 over the same period in 1979. The real credit for that decrease he said, must go to individual consumers who are preparing themselves to cope with the energy situation of the future.

Burns continued, "It now appears as if pricing energy at its real or alternative value has become a cornerstone of our national energy policy." Oil prices will rise at least 2 to 3 percent faster than world inflation. Higher prices will make it possible for alternative energy sources to compete more effectively.

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Despite the evidence of increased attention to conservation, and to alternative sources of energy, Burns pointed out that we are still dependent on foreign oil and will continue to be during the remainder of the century. In this "real" world, health care facilities will not be shielded from rising energy costs or decreasing energy availability. After all, health care facilities are dependent on the goods and services of the entire economy and for them to function well, the entire system must work.

Cogeneration is a viable option in some places, and will be used increasingly. Burns foresees that existing patterns of fuel use will continue—that is, coal will be used mainly for power generation and oil and gas for space heating.

Hospitals are dependent on gasoline because the transportation need of both patients and staff is the largest single user of oil (over 40 percent). Gasoline consumption is down about 8 percent over a similar period a year ago. Burns outlined several ways in which hospitals can conserve gasoline use: (1) maintain higher inventories of consumable items in order to reduce delivery frequencies; (2) encourage employees to form car- or van-pools; (3) provide preferred parking to such pools; (4) provide bike racks; (5) work with local transit systems and schedules to provide a shuttle bus route for employees and advertise routes for patients; (6) larger hospitals may consider establishing small out-patient satellites. However, in all areas, health administrators must consider patterns that best fit the needs of the community, viewing the health care delivery system as part of a larger integrated community.

Burns concluded with observations on the inpact of the new energy future on the health care system. In the short-run he said there may be more demand for health services. Lower temperatures in buildings may have deleterious effects on people with pre-existing conditions like the elderly. In the long-run though, it is possible that a more energy efficient future may have the opposite effect. More walking, and bike riding would be a health benefit, as would reduced use of autos with their resultant pollution. Such factors he said, may well "channel the demand for health care away from curing the sick to care of the healthy." Whatever the outcome though, Burns said, "the future will not look like the past. We must all develop the flexibility required to adapt to the new realities as they become apparent."

Next on the podium was ***Lynn Wilkenson***, Public Service Company of Colorado, who pointed out that the primary purpose of the Natural Gas Policy Act of 1978 is to allow for higher prices at the well-head to provide incentive for producers to explore and develop additional gas sources. Increasing gas prices allowed under the Act (which provides for fully decontrolled gas industry by 1985) may cause a Congressional reaction. If there is no such reaction, by the late 1980s, gas will seek its natural price level in the market place.

Wilkenson reported the actual gas prices for a Denver health care facility. The facility paid 21¢ per million BTUs in 1970. The price rose steadily until 1976, at which time it really began to increase and by 1979, that facility paid $1.72 per million BTUs. Forecasting increases, Wilkenson said gas will increase at a rate of about 50¢ per million BTUs per year, so that in 1985, when deregulation is fully in place, gas will be in the mid $4.00 range per million BTUs and in 1990, that cost will be about $7.30.

Will gas, at those prices equal the cost of oil? Although that is anybody's guess, many think gas will run about 20 percent below #2 fuel.

Hospitals, said Wilkenson, are exempt from the incremental pricing provisions of the Natural Gas Policy Act. Those larger boiler fuel users that are not exempt are actually picking up part of the increased costs of gas at the well-head. This is an attempt to keep the bill as small as possible for small commercial and residential customers. Hospitals are included as an exempt user, along with residential, small commercial and schools.

Turning from price to supply, Wilkinson said that the supply for the next 20 years will be good. The Natural Gas Act is providing incentives for producers to get out and explore and develop. Conservation is having a significant impact, with an 8 percent per customer decline (on peak days) for public customers. The Public Service Company of Colorado has been encouraging conservation efforts through promotion, information, home energy audits, and insulation programs. One result has been a nearly 18 percent decline in gas use by Denver area interruptable customers. The substantial drop in new home construction in the area has also contributed to the improved gas supply situation in the Denver area.

However, the forecasts for the future are not as rosy as they once were. The reserve life of pipeline supply in the Denver area is 9.8 years. That same prediction in the early 1950s was for a 25 year reserve life.

Phillip Burgess, Executive Director of the Western Governors' Policy Office outlined for conference participants, how the Governors and their offices are working in the area of institutional relations, and thus how they might be helpful to health and energy concerns.

Prior to the establishment of the Western Governors' Policy Office (WESPO) in July 1977, there were 131 human service associations in the 10 State area. WESPO strengthened the policy management capacity of the Governors and harnessed the resources in the 10 (now 11) States with other multi-State organizations.

WESPO is trying to insure that innovations in one State are made known to people in the other States and is con-

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centrating its efforts in three areas: water; regional equity in budget reduction; and making sure that efforts are renewed to revise formula funding so that it becomes a balanced process representing national areas more equitably.

In the energy area, WESPO has been meeting with Indian tribes which have formed the Council of Energy Resources Tribes. Both WESPO and the Tribes are considered in the development of new energy sources. Burgess added that it has not been the States which have impeded energy development, but rather Federal laws and regulations.

Connected to energy considerations, is WESPO's interest in exploring opportunities of active State participation in international trade. Since the crisis in Iran, both Japan and Taiwan have decided to change their fuel mix and turn more extensively to steam coal. The Japanese, said Burgess, like to deal with selling consortiums (cartels) which are outlawed in the U.S. WESPO is exploring institutional arrangements among the States where, under their policing powers as provided by the Constitution, they might be able to form trading companies to assist the private sector to sell not only coal, but other commodities to an international market.

Tom Drabek, Department of Sociology, University of Denver, has a research and practical background in disaster planning, and drew on that experience to discuss public perceptions, reactions, and collective planning for disasters, relating these to energy and health contingency planning.

Parts of the public, even energy and health professionals, feel that energy shortages and related emergencies are part of a conspiracy. This is not a unique reaction. It is a response to warnings and uncertainty and results in hostility toward Federal and industry officials. Translated into the concerns of the conference, this phonomenon means that when you talk to others trying to mobilize them into action, they may well have a posture of distrust, an unwillingness to believe. Drabek said people will be very creative in selecting out information that will allow them to deny that there is a problem.

Despite these denial processes, Drabek said that disaster research still gives cause for optimism since he sees that people do act once they see that there *is* a disaster. The action can be exceedingly innovative. Another characteristic of reaction is that people are highly protective of those who are closest to them.

When planning for contingencies, anticipate innovative public response which is directed to those closest to the family unit. Some of the best designed disaster plans have been total failures because they did not recognize real citizen reaction. For example, Drabek cited a disaster in which numerous people were injured. People did not wait for appointed transportation systems, nor did they wait to be told which hospital to take injured to. They did what they could as fast as they could. As a result, some hospitals were inundated with the injured, yet those best equipped to treat injuries were underutilized.

A fundamental principle of American society is that it is highly decentralized. Response systems that emerge in disasters are very loosely coupled. Yet our management systems are rooted in the theory of a firm hierarchy. This does not fit needed planning for the diverse elements which must be involved in disaster responses. Therefore, anticipate, in planning for health and energy contingencies, that units which must be coordinated and organized are very parallel, and that it will be difficult to get the planning coordinated. Recognize that, and do not become discouraged when it happens.

There is a second premise to recognize according to Drabek, and that is that respective managers (both public and private) are going to be guided primarily by protecting the autonomy, security, and prestige of their unit, rather than some general altruistic interest for the common good. However, recognizing that, you can forge new alliances. An example of these kinds of developing, experimental alliances is the coalition of various interests in the National Alliance, mentioned earlier in the conference.

Disaster planning, says Drabek, is a very low priority item in all communities. As a result, conferences like this usually do not result in concrete work. People go back to their "real" jobs, other things are more pressing, and time drifts. Thus he challenged conference participants to write down two dates—May 26 and October 13—and on those dates put the question, "What Have I Done," as a reminder to accomplish some health and energy planning.

Drabek elaborated on overcoming "turf" problems. In the concept of domain consensus, agency representatives establish an agreed upon division of labor in a collective effort. That division of labor has to be one that the agencies can make a commitment to. Then play a game of "What would happen if . . ." This has been an effective tool in disaster planning. If this happened, what would this agency do? This lays the groundwork for when a disaster (or contingency) does occur. People have some sort of established agreements about what they are going to do, and planners will have trouble if those agreements have not been established. But remember, in establishing those agreements, you are not operating as a member of the firm or the agency; thus, you cannot issue orders. You do not have that kind of authority, and the agencies won't let you get away with it.

Second, you must reduce the ambiguity of your information. At this meeting, for example, a number of in-

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terests have been expressed. To make headway Drabek said, you must dissect the problem into smaller elements and then look at those as they relate to your particular problem. You are then building up a reportoire of response mechanisms for emergencies generally. Remember: dissect; reduce ambiguity; deal with the credibility issues, particularly in reference to contradictory information.

Gordon W. Berg, representing the Division of Energy Policy and Programs, Bureau of Health Facilities, took a cue from Drabek's presentation and started his talk with the unambiguous statement that health facilities will be shut down because of energy related contingencies. The causes will range from not enough energy to operate, to inability to produce enough generating capacity during extended brownouts.

The future will bring increasing energy prices, and decreasing fuel supplies and the result will be major economic disparities. That projection for the nation's economy will directly impact, in every sense, on the health care delivery system. Unfortunately, said Berg, there are many decision-makers and health planners who fail to see the relationship between major economic changes and the ability to deliver health care.

An example according to Berg, is the view held by planners and administrators that hospitals are high priority users who will be allowed to continue to operate at full capacity in the event of fuel shortages. However, a survey conducted by the Division of Energy Policy and Programs (DEPP) in late 1978, found that utility companies generally do not have priority fuel schedules. Utility representatives interviewed felt that hospitals have their own generating capacity and are thus self-sufficient.

Decision makers and planners must start realizing that they cannot take for granted such luxury items as capital, personnel, equipment, supplies, and transportation. They must realize that the cost of money has increased 50 percent in 1 year; the cost of heating oil has doubled in the same period; the cost of gasoline has increased by over 90 percent. For the prudent manager, there can no longer be a status quo attitude.

A number of things are already occurring in this country, said Berg, to reduce our dependency on foreign oil. Private industry, for example, estimates that within the next 5 years, capital investment in the energy sector will come close to $3 billion to develop alternative sources of energy.

Health facilities are already doing a number of things concerning energy savings. The greatest savings has been achieved in conservation. In solar energy, DEPP has already funded, on a cost-sharing basis, 11 health care facilities to use solar for domestic hot water and space heating. We are aware of six facilities that are already on geothermal, or are ready to convert to such a system. The Presbyterian Community Hospital in Klamath Falls, Oregon, investigated geothermal in 1974 and by October 1976, their geothermal system was fully operational. At that time, they estimated that over the life of the facility, they would save $22 million in energy costs. Today, it is estimated that they will save, conservatively three and a half times that amount.

Two health facilities in the State of Washington are currently using wood pellets as a primary fuel for heating. These pellets are a by-product of wood, cost $22 a ton. The pellets burn clean, leave few ashes, and are easier on equipment.

Lancaster General Hospital in Pennsylvania installed a heat recovery system from their incinerator which realized a full payback in 2 years and is now generating substantial savings.

Other alternate energy sources already being used include peat, biomass, methane gas, and gasohol.

Berg mentioned the above examples to illustrate that health facilities are actively pursuing alternates to traditional fossil fuels in an effort to maintain their economic viability.

The present reimbursement system, which passes through energy costs, is the main reason that health facilities have not had to give much serious attention to energy—either its availability or its cost. The fact that energy costs are passed through to consumers and third party payers in itself contributes to rapid escalation of health care costs. We need incentives for those health facilities that do conserve energy, and penalize those that do not.

A 1976 survey conducted by DEPP showed an alarmingly high proportion of the nation's hospitals rely on a single source of fossil fuel; 32 percent use only gas; 13 percent use only oil. If OPEC should announce a total oil embargo, or should a war break out which affects transportation of oil, effects on our health care delivery system will be traumatic. Hospitals will close or cut operations. Life-support systems and laboratories will loose equipment functions unless they can be operated manually, often by personnel not trained for that. The ability to shift patients among facilities will be reduced or impossible. Facility staff will be required to operate without essential backup equipment. Other staff will not be able to get to the hospital, forcing remaining staff to handle a double workload. Among the population, medical emergencies will have no way to travel either to the hospital or to a physician. Medical supplies will be delayed, or not delivered to patient centers, particularly those in rural areas. The production of medical equipment and drugs will decrease, or halt.

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That, said Berg, is the "What If" scenario. To continue to deliver health care requires previous planning. That planning must be done now.

George Schiel, Vice President, Shared Services, Colorado Hospital Association, spoke next, providing an overview of the long range impact of both energy shortages and cost increases on the health care delivery system.

Within the health care facility said Schiel, we do have a good idea where energy is used: from 40 to 60 percent goes to the heating, ventilation, air conditioning; about 20 percent goes into electrical use (lights and equipment); and between 15 and 20 percent is used in laundry operations.

The Shared Services group has been involved in stimulating hospital responses to energy saving programs. They perform energy audits, document payback for installation of energy conservation devices; coordinate energy efforts, and work for various code changes which will aid conservation efforts.

According to Schiel, stimulating hospitals to be involved in energy savings programs is difficult. Energy is not a priority in our health care facilities since it would require additional time and staff with expertise in energy management. These are not seen as useful expenditures that would ultimately save costs. Also, the data necessary to give hospitals a basis for energy conservation efforts is lacking. There are no measurements for energy expended per patient day.

A number of things must be done in order to achieve short term behavioral changes in the attitudes of health care facilities toward energy conservation. As a first step, hospitals need to be educated on the no capital or short-term payback procedures in energy conservation. We need to work cooperatively on changing codes and standards which were established in an era of cheap energy. For example, variable air change requirements should be examined for possible energy saving changes. New technology is available, and should be implemented. Examples include waste heat recovery and sophisticated monitoring systems.

Rural hospitals have special needs, which should be addressed. For example, they will have to consider gasoline allocations more carefully than urban facilities, both for ambulances and employees. To aid those facilities, we must start reversing the health planning thrust toward regionalization, which may require ultimately more travel time and more gas. We need to emphasize "health" rather than "sickness" care in our systems.

In the long range impact of the new energy era said Schiel, we must consider a number of items in our contingency planning. We have to pay attention to systems developed, and the inter-connecting elements of those systems. Sharing services, in laundry and power plants, for example, will save energy and money. The transportation system in our regions must be considered in reference to moving our employees and patients in the most energy efficient manner. "Exotic" telecommunications systems may prove to be an energy efficient link between facilities and employees, between hospital staff and universities.

Workshops

On the second day of the conference, participants were divided into discussion groups to address a number of topics. Summaries of those meetings were later presented to the conference. The following list of comments and recommendations is not all inclusive, but represents the subject matter discussed.

- It is not really fair to compare energy consumption among health facilities. Some facilities are more energy intensive because of laboratories, etc.
- Cost reimbursement dollars are in conflict with energy needs (capital dollars).
- The message of energy management and contingency planning must be gotten out at the local level, not just to a few who attend a major conference.
- The health care sector needs direction on how to tie in local transportation systems to improve health care delivery.

Recommendations

- Reduce the period of depreciation for energy savings and capital projects from the current 20-30 years to 7-10 years.
- Review and revise ventilation standards.
- Revise the reimbursement system for energy expenses.
- Establish guidelines for reusable items.
- Shorten Certificate of Need time for energy projects.
- Develop guidelines on how hospitals could coordinate services with other local health facilities.
- Develop procedures for assessing probability of occurrences for energy shortfalls.
- Assign a Federal person full time, to work in each region just on health energy matters.

CHICAGO, ILLINOIS

June 26-27, 1980

Jointly sponsored by
the Bureau of Health Facilities
Blue Cross/Blue Shield
National Alliance for Energy Contingency
Planning for Health Resources

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The series of six national meetings on Energy Contingency Planning for health facilities concluded with the Chicago conference. The tone at this meeting was set by *Thomas A. Robertson*, a Washington, D.C. based energy consultant and former coordinator of the Energy Center at the University of Florida, who gave a graphic definition of contingency and the relationship between energy and our nation's continued existence as a viable structure. Robertson pointed out that contingency is related to choice and that this nation and all its systems, "are in the same position as a fuel gauge in a car. The fuel gauge is like a contingency. If you wait until the gauge shows 'empty', you have lost all your choices."

He pointed out that energy is more than fuels, it is the foundation of our society. Since 1971, hospitals have increased their primary energy use by 8 percent a year. Yet, domestic production of energy has not increased since 1962-63. That is, according to Robertson, "a massive warning that our health systems are going to start undergoing large, traumatic change," since they will not be able to continue increasing their use of energy. How the health system survives will depend on "the strategies you can develop on maintaining the highest health services possible with the energy you can get." That, says Robertson, is not much more than advocating good bookkeeping, integrating energy awareness with financial awareness.

It is institutionally imperative, said Robertson, to start looking around the "cliches" and find out what will work "for your own interests." Expect a number of confusions when you start doing this. For example, real energy price can be confusing. What is really less expensive in terms of BTUs? How does the price of energy become embodied in a product and how do energy prices work out in the marketplace? Robertson compared agricultural products, which are not seeing a real reflection of energy costs, to health where hospitals can translate energy costs for services much more quickly into the payment structure since it is picked up by third party payers.

There is little hope that new technologies will reduce energy costs. "Any of the alternative energy sources, including nuclear, are probably six or more times less concentrated, and therefore, energetically more expensive than the primary energies that are running our country," Robertson said. However, there are two things facilities can start doing immediately: (1) get facility finance officers to talk to energy people, and (2) start asking your institutional associations to obtain quality information on what energy you are going to get—irregardless of what energy you want to get—and then develop a range of possible strategies based on that information, about what is going to work.

Robertson concluded with the caution that health must learn to deal with inflation. It is not going to go away because, as we increase the amount of energy in our system, energy prices will be injected back into the system, and it will show up as inflation. But, "people who know their own interests, given appropriate direction, can do something within their industry. We can deal with the problem, all we have to do is recognize the problem."

Ed Bertz, Manager of the American Hospital Associations' Department of Health Facilities and Standards, chaired the first day of the conference. He spoke briefly on the National Alliance for Energy Contingency Planning for Health Resources, formed almost one year ago as the result of a meeting similar to the Chicago conference. Bertz said that conversations between health and energy people must be maintained, and that the National Alliance started on the premise of establishing and maintaining such a dialogue. The Alliance has continued to meet, and is now forming a non-profit organization which will link different sectors in American life that deal with health and energy. He emphasized that the Alliance is made up of individuals, not organizations, though there are members in the Alliance from the Federal Government, individual health systems agencies and hospitals, the Blue Cross/Blue Shield, the American Hospital Association, and an automative association. The Alliance will keep health and energy organizations posted on its activities.

Bertz then introduced Marvin Gough, head of the AHA's National Cooperative Effort which deals with en-

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ergy and elements of the health care delivery system. Gough noted that energy costs for hospitals this year alone are in excess of $2.5 billion and are expected to reach $3 billion in 1981 as a result of oil decontrol, deregulation of natural gas, and OPEC increases. He compared this to the $17 billion paid for all energy forms for the nation the year prior to the first Arab oil embargo, and pointed out that hospital energy costs in the average hospital are approaching the total amount being spent for all pharmaceutical supplies and medication used in the care and treatment of patients. He said that the AHA, through the National Cooperative Effort, plans to provide direct support to hospitals on energy conservation, accounting, and planning.

The next three speakers on the conference agenda were representatives from electric and natural gas utilities, and a gasoline company.

R. A. Bulley, Assistant Manager of System Planning for Commonwealth Edison in Chicago, predicted that the use of nuclear generated electricity will increase and that no alternative means of power generation will have an impact during the coming decade. The only ways in which to reduce electrical consumption, according to Bulley, are cogeneration (where it is economically justified), rate incentives which encourage the shift of use from peak to off-peak periods, ice storage systems for air-conditioning, interruptible load contracts, and conservation in general.

Bulley said that mid-west utilities have evaluated their needs, and developed plans for an adequate supply for the coming decade. However, should plans prove inadequate, the effect on health facilities will be avoided in any shortfall, as hospitals are expected to have a high priority for fuel usage. Prices however, will undoubtedly go up though the influence of oil uncertainties is, overall, largely absent in the mid-west.

In response to questions from the floor, Bulley added that Commonwealth Edison expects nuclear generation will produce over 60 percent of the area's electrical power by 1990. Nuclear generation will not be cheaper, however, because of inflation. Nuclear plants are, according to Commonwealth Edison, expensive but will generate electricity more cheaply. "Licensure" according to Bulley, is "another matter" since State commissions are often swayed by those who feel nuclear is not the way to go.

For the future, Commonwealth Edison has been participating with other groups such as the Electric Power Research Institute and the Department of Energy, in looking at fusion and other long-term energy sources. However, according to Bulley none of these will have an impact for the next 10 years.

Mr. Bulley then responded to several questions from the floor on co-generation. One individual reported that his local utility had said the local rate was not conducive to co-generation. He asked for clarification. Bulley pointed out that last year, as an example, Commonwealth Edison produced 43 percent of its energy by nuclear power and that no co-generator would be able to produce energy as cheaply as nuclear-generated power. The Federal Energy Regulatory Commission (FERC) has ruled that a utility must buy electricity that is co-generated *if* it is produced at something near the price the utility would have to pay to produce that electricity. FERC rules may be translated by each State Commission, which may take into account the demand ratio of co-generation. Perhaps, said Bulley, such co-generation may not be counted on as a reliable demand source. If that can be proved, unreliability may be taken into account for the value given to the electricity produced by a co-generator.

Mr. F. F. L. Gaertner, Manager of Market Analysis, Natural Gas Pipeline Company of America, introduced his presentation with the observation that we are currently in a situation of "surplus energy." Though we are uncertain how long this situation will last, the switch from electricity to natural gas continues unabated. This price induced conversion is occurring because natural gas is cheaper, though we cannot, said Gaertner, predict either supply or cost. Acknowledging that forecasting is an inexact art, Mr. Gaertner showed a number of slides to conferees, comparing various demand forecasts. In 1975, Exxon projected that by 1990, total energy demand would be 120 quads; today that forecast is down to 87 quads. Natural gas forecasts have remained rather stable. Oil availability has declined, coal use forecasts have been changeable, the forecast for hydroelectric power has been stable, and the nuclear outlook, according to forecasts, is continually diminishing. The outlook, already being experienced, shows that transportation sectors will conserve while the industrial sector will increase energy usage.

Gaertner said that natural gas could be called on to provide more of American energy if needed. Potential gas supplies could, by 1990, contribute 23 to 32 quads of energy, which would be one-third of the total energy requirements for the nation. The drawback is that oil has a wider variety of uses than natural gas. For example, it can be stored more readily.

In the long term, there should be a supply of about 35 to 65 years of economically recoverable resources of gas. At least 195 quads are proven reserves, and the forecasts estimate that another 200 quads might be available. This translates into another 10 years of assured supply and an additional 10 years of reasonably assured supply.

An interesting historical perspective came from Mr. Gaertner's presentation. He said that in 1940, electric prices were almost twice as high as they are today. Energy got cheaper every year from that time until the 1950s, and

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even todays high energy prices are not as high as they were in 1940. There is no way to stop the current escalation of energy costs. "Energy prices will increase in real terms faster than the gross national product," said Gaertner. Absolute price increase predictions are hard to make since price depends on utilization patterns. Gaertner concluded, pointing out that natural gas prices are low now, but will increase. According to the Department of Energy, the price of natural gas should approach the cost of imported oil.

The last energy representative was *Tom Burns*, with the Economics Department of Chevron, who cautioned that the present "calm," the perception that gas shortages are over, is "illusory." Meetings such as this, he said, are important, for it is the consuming level of the energy industry that can influence the oil and energy consumption in this country.

Burns pointed out that consumers are doing something about energy conservation. The consumption of oil has already dropped dramatically, down 2 percent in 1979 from the previous year, and down 9.3 percent from that level during the first 5½ months of 1980. This conservation effort is based on the realization that "It pays to save something valuable," said Burns. He predicted that higher prices for oil—achieved in part through decontrol—will make it possible for alternatives to compete more effectively. However, this nation will continue to be dependent on oil imports for the rest of this century.

Next on the speakers' roster was *Martin G. Anderson*, Executive Director of the Comprehensive Health Planning in Southern Illinois (CHPSI). Anderson addressed the potential impact on health from high energy costs, and health planning responses to this new and pervasive situation. He cautioned that he spoke only from the perspective of his HSA and could not speak for the other 200 plus agencies in the system.

The health system, like other socio/economic systems in this country, has developed on a base of cheap energy. More expensive fuel will have a major impact, and require major adjustments, in the health care delivery system. Health planners cannot do anything about those costs. Energy and its costs are a given which must, in some manner, be accommodated by the system.

Life style changes are already evident in reaction to energy costs and availability. Automobile use has been reduced. Anderson said it is too early to tell whether this reduced use will cause a subsequent increase in dependence on the family and local community support systems, but if it does, it has the potential to reduce health costs through a greater personal responsibility for one's health and a growth in wellness concepts.

The present health care system is energy intensive. An in-patient oriented, high technology medical system prevails, bolstered by protective legislation and sheltered by a risk reducing third party payment mechanism. However, with rising costs, health care could become less accessible, and cause an imposing financial burden. Though energy is only one part of the rising cost phenomena, that increased cost and decreased accessibility will lead to a continued pressure to re-evaluate the ways of meeting health needs. Rural areas in particular will be forced to explore less costly means of enhancing and maintaining health, focused on holistic health, self care, and home care, designed to keep individuals out of expensive and restrictive health institutions.

Anderson cited several areas in which his agency has been working in response to energy-related problems. A rural ambulatory care system is being developed in Southern Illinois, and the CHPSI home health care task force developed a planning document as part of the area's health systems plans. That document described acceptable standards and means of addressing health needs in the home setting.

A rural adult day care center demonstration is underway in Carbondale which is also the site of research and demonstration projects on solar energy. The elderly are the focus of two additional projects: in Benton, Illinois the neighborhood senior citizens self-help groups, provide insight into self-help and community support for those who might otherwise be institutionalized; and a Public Transportation Demonstration Project for the elderly and handicapped is being conducted in five southern counties of the CHPSI area. It is hoped this latter project will provide a cost comparison between institutionalization and other settings for health care.

CHPSI is also considering establishing energy specific standards and criteria for projected review of facilities and services.

Anderson concluded by pointing out that "under relentless economic pressure it would seem planners have three broad options to help communities plan health care systems in the forthcoming years of fuel shortages and high energy costs:

1. To help the medical system redirect existing health care.
2. To help establish new wellness oriented systems.
3. To work simultaneously toward both 1 and 2 above."

However, he said, it is "prudent to recognize that health planning efforts will not succeed without concurrent/supportive changes in payment policies. In a private fee-for-service system, services follow the money. The third-party payment mechanism now shields the estab-

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lished system. A change in payment policies would lead to a redirection of the system."

In a spirited question and answer session following Anderson's presentation, the point was made from the floor that HSA's have not recognized that a slightly higher initial project cost can demonstrate significant energy cost savings over the life of the building.

Joseph Emanuele, President of Healthcare Resources Corporation, in Reston, Virginia, spoke next, and based his remarks on his background as a consultant to long-term care facilities and nursing homes.

Emanuele made a number of suggestions on tactics that should be adopted by each health care facility.

(1) Develop a program on energy contingency planning, run by an individual who has enough clout so that the program is not viewed as a token.

(2) Then make out an inventory—one based on services—in which the real health needs of the geographic area are determined. Base facility services on those needs, not on "competition" with other facilities.

(3) As a next step, analyze by type, cost, and consumption rate, the energy the facility is using. That data is needed to determine whether future conservation programs are doing the job.

(4) Find our the type of emergency generation the facility has and determine whether it is capable of co-generation.

(5) Determine the facility's customer services status from various fuel suppliers. As an example of what can happen should health care facilities "assume" they have high priority fuel status, Emanuele cited the State of Pennsylvania where health care facilities rank number ten, behind the motel/hotel industry. The reason, he said, was that the motel/hotel industry got together, lobbied, outlined the potential loss of tourist dollars, and thus obtained a fuel priority higher than hospitals.

(6) Health care facilities should consider whether any of their health services could be consolidated. They should examine the potential for shared services.

(7) Employee and visitor transportation must be considered. In the case of nursing homes, visitor transportation is of greater concern than it might be for hospitals, since LTC units are residential. A gasoline scarcity might result in LTC residents being moved by their families to facilities closer home. Also, if gasoline allocations were put into place, LTC facilities face the implications of not being able to transport patients for services such as physical therapy, if they do not provide such services within house.

Emanuele concluded by outlining a number of the community-based considerations for the facility energy planner. Know the number of hospitals, the number of LTC's, the number of residential care communities. In the case of energy short-falls, service changes may have to be made, and these should be linked to community plans.

Look at gas rationing, and how it would affect the health care field. Bring what you find to community and State attention. Statewide planning should involve emergency or disaster evacuation plans, which should be based on your findings and feedback.

Consider the reimbursement impact on your facility if you have to close down temporarily. Talk to your State reimbursement agencies, and ask what happens if you have to consolidate services, or close the building.

Work with your State licensing agencies on possible energy regulations. Work with the building codes. If you have concrete programs and recommendations, developed with other local facilities, go with that information to the State, and from the State, to the Federal Government. After all, the Federal Government does not have all the answers. Emanuele emphasized to the conference that, "If you are motivated, and provide information from the grass roots, the Feds will have a better shot at the planning they must do."

Christ Hospital, part of the Evangelical Hospital Association, is a facility which has done some concrete planning, and carried through with activities that have been successful in reducing energy consumption. *Carl Lundgren*, Corporate Director of the Facilities Project Management for that Association, spoke about the energy projects to the Conference attendees.

The Evangelical Hospital Association owns and operates five hospitals in the Chicago area, as well as a free-standing school of nursing and a laundry facility that services the entire system. Lundgren said that these structures include "a mix of brand new building, older buildings with new additions, and still older buildings that are totally obsolete." This has given EHA a broad spectrum of health facilities in which to experiment in the realm of energy conservation.

The Evangelical system has not, to date, participated in community wide planning. Rather, it has focused on efforts to accomplish two things:

1. "to build a data base in each one of our facilities to enable us to measure any changes that might take place in our consumption of energy due to some of the programs that we planned to institute, and;

2. to implement immediately those programs that were universally accepted and relatively easy to do. Then, to use our data base to enable us to put proposed programs in some semblance of priority so that we might move to implement them as it becomes economically feasible and energy advantageous to do so."

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Mr. Lundgren proceeded to outline the concrete steps then taken. Those follow in abbreviated form:

- shut off fan system supply to unoccupied areas after hours
- increase or decrease average temperatures where possible
- manual control of electrical components to stagger or decrease load
- improved effectiveness of building preventive maintenance programs, especially those concerning HVAC related equipment
- use infrared scanning to pinpoint malfunctioning areas in steam traps, machines, pipes, or ducts
- controls for cooling or heating.

Despite the effectiveness of the above, Lundgren said the "most important energy saving device is the education of our personnel, and our patients to acceptance of a new environmental setting."

Mentioning that Gary Mielak, Director of Facilities and Engineering at Christ Hospital would be presenting a specific outline of conservation in that facility, Lundgren said he would concentrate on two programs put into effect at Good Samaritan Hospital, located in Downers Grove.

That facility, designed when few dreamed of the present energy situation, had two large boilers, each sufficient to carry the total load for the hospital under most conditions. The administration installed a small boiler that was capable of carrying the entire load at certain times in the year. At other times, the small boiler was put on line with the large, thus negating the need to fire up the second large boiler.

Water quality at the facility was poor, so the administration installed a reverse osmosis (RO) system, negating the need for chemical treatment of the water going into boilers and other parts of the system. Savings realized because of the new small boiler were $31,121 in the first year, and savings for the water system $12,000. Adding the RO water system to equipment in central processing added another $1600 in savings.

All the Evangelical hospitals are working together to solve the cost of waste incineration, which involves tremendous quantities of plastic waste. This particular waste produces corrosive by-products which damage the incinerator. Finding a substitution would enable the facilities to keep maintenance costs of the incinerator within acceptable bounds, and will allow a savings in compacting waste, shipping it, or burning it in incinerators where there is no method of recovery of heat.

Lundgren said they are also considering retrofit to reclaim waste heat from the linen processing facility. That would cut the energy costs in half.

He concluded with an optimistic note. Considering that health facilities are complex, 24-hour a day institutions, they are staffed better than most private or even government institutions. The constant pressure to keep health care costs down, creates, he said, "the absolute need to be leaders in the conservation of energy. Because of the pressure, we should, by necessity, reach many of our goals before other groups or institutions. What will be needed then is to pass along our hard-earned information, at seminars like this one, to others in our industry, to other sectors of our economy, to our immediate neighbor, the homeowner, to whom a reduction in energy costs would be a godsend."

Lundgren then introduced *Gary Mielak*, Director of Facilities and Engineering at Christ Hospital, who now is also Assistant Administrator at that facility. Mielak presented a short outline of the energy containment program at Christ Hospital which has produced measureable results since it started in 1977.

The hospital has an 850 bed capacity, with a 90 percent occupancy rate. The decision was made to put 650,000 square feet of the facility under the energy program. The energy users which had to be considered included the heating, ventilation and air conditioning system (HVAC), lighting, data processing (which has become a very large part of the electrical load), domestic hot water, room service, medical laboratory, and x-ray equipment, and more recently, nuclear medical equipment.

According to Mielak, a good plan "requires that you have a clear idea of the end objective." That objective, in Christ Hospital's case, was developed in 1977, and agreed to by the hospital administration and corporate management. The assistance required to meet stated objectives could not be met with manpower from the regular operations of the facility so the hospital hired a contractor, a certified test and balance company, which proved to be a leader in the field.

Details for the physical audit, and the final step in the first phase of the hospital's program was completed in the third quarter of 1979. That program included: the audit, developing a full data base of operating characteristics for the building, applying for grant monies available for technical assistance and reimbursement of audit costs; implementing a low cost program to show a definite and effective energy down turn; and at the same time, setting in motion plans that will, by late 1982, reduce total consumption by 30 percent since the 1978 implementations.

Christ Hospital uses the Federal Energy Utilization Index in measuring energy performance. In 1977, that index was 415,000 BTUs per square foot per year. That has been

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reduced 8 percent to date, and the facility anticipates that by mid-1981, it will be reduced another 18 percent and by mid-1982, reduced by the final 7 percent. That would bring them to an index of 290,000 BTUs. However, Mielak said, they do not envision that as a bottom line number, and in 1982 will identify additional percentages for reduction.

Mielak pointed out that using the index poses interesting questions. As he said, "your square footage may remain the same, but your services may expand." The result is that you are using the facility more intensively for longer periods.

Mielak then outlined the specific actions taken to achieve the percentage reductions in the Energy Utilization Index:

1. *8 percent reduction range*: This required virtually no cost except manhours. They reworked the entire preventative maintenance program; gave mechanics a training program using methods from the Technical Publications Company; started their own training course for licensed building engineers; weatherproofing; greasing equipment, and infrared scanning. The 8 percent reduction achieved, measured in 1977 dollars, was well over $100,000.

2. *17 percent reduction range*: This included complete installation of more enthalpy controllers for free cooling; installation of heat recoveries on boilers and additional computer capacity to be sure that cooling and heating equipment was being used optimally.

Christ Hospital is looking forward to their first "real energy contingency planning project" according to Mielak, the use of recovered heat from waste disposal.

Mielak pointed out that the benefits of their program have extended to corporate member hospitals and to member churches. Already, possible solar applications have been identified for one church and for a holistic health center.

Gordon Berg, representing the Bureau of Health Facilities, Division of Energy Policy and Programs (DEPP) spoke next on the economic impacts of energy on the health care system, and the resulting potential for a changed system in the next decade. He prefaced his remarks by pointing out that health care facilities are not assured a priority treatment in fuel allocations. He cited a phone survey, conducted by the Division, of oil-based electrical utilities in the northeast. The general consensus illustrated by a quote from one of the utilities, was that health facilities have "their own generating capacity." He advised conferees to look into the realities of fuel priorities in their areas, and to talk to suppliers and utilities. He also advised conferees to keep in mind Executive Order 12185, and its possible impact on facilities in the health care system. That Executive Order says that if you are a recipient of Federal funds, in any way, you may come under criteria for energy conservation.

The outlook for the coming decade, according to Berg, is for continued increase in energy prices, and increasingly tight supplies. We have seen some energy prices increase in the past two years at a rate of almost 100%. These costs are directly related to the soaring cost of our health care delivery system, and our record-setting inflation.

Berg outlined the current economic conditions. Disposable incomes are continuing to decline. Several industries are in trouble—particularly those tied directly to fossil fuels such as the auto industry. Domestic, as well as international, bankers are seriously troubled by a monetary system badly out of kilter. Oil importing countries, including the U.S., are piling up massive debts. The Federal health budget is being buffeted. In FY 1981, an estimated $35 billion will be spent for hospital care under Medicaid/Medicare; however, the numbers of poor and elderly increase. About 24.5 million Americans have incomes below the income poverty guidelines, 22 million have no health insurance, and an additional 20 million have inadequate insurance. Those figures begin to point out the colossal differences in standards of health care for all, and the resources available. Rising unemployment will bring with it millions more citizens who have no health insurance, and no excess disposable income for health costs. The number of jobless workers has risen 27 percent since November 1979, and, according to the United Auto Workers, fewer than one-third of the nation's unemployed workers have insurance to cover medical costs.

According to Berg, "There are indications that reimbursement and the current health delivery system has passed its economic efficiency, and that competition is getting more attention. But competition and cost savings are often in conflict with social concerns." And, as long as the Federal government is expected to pay for more and more health services there will be regulations, in part, to account for the massive number of tax dollars being spent. However, fewer tax dollars could mean less expenditures, thus less regulations.

Severe economic constraints could drastically affect reimbursement patterns, thus health care delivery. Businesses have been finding health care benefits an increasingly onorous load. The future could bring decreased health benefits, a sharp acceleration in industry sponsored HMO's, and salaried health personnel on-site (a return of the "company" doctor).

Faced with the eroding tax base, and an urgent need to pump vast amounts into defense and energy research and

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development, the Federal sector will find it has reached its growth ceiling in providing health dollars and benefits.

Gas rationing, no matter how ill-prepared we are to handle it, may come caused by a severe, long standing oil supply interruption from the unstable mid-east nations. Should that happen, some experts, including Stanford University's Henry S. Rowen, indicate that the U.S. might have to pay $200 for a barrel of oil. Severe gas rationing would end all but the most essential travel, completely altering life, work, and health delivery patterns. Possible scenarios in this instance would include hospitals using closed out wings or wards for work-week living quarters for staff. High technology, energy intensive health care may be rationed, with subsequent massive revision of the definition of malpractice.

In the context of economic dislocations and energy shortages, Berg outlined probabilities to be addressed by health facility managers:

- Engineering staffs will become equal decision-makers in hospital functions.
- Operation standards, developed during the era of cheap fuels, will have to be re-examined and defined.
- Alternative energy sources will be considered more seriously, and those which are feasible will be added to renovation schedules.

Facilities must consider the possibility that economics, and drastically altered traffic flow, may cause closing of some hospital service areas. Determine what services you could share, what the labor and licensing implications are. Consider other uses for closed areas. Could your kitchens subcontract to provide menu service to adjacent businesses or schools? Could you open an ER or OPD as a literal storefront facility, located in a shopping mall or other population center? If plastic, fuel-based feed stocks become unavailable, are your employees trained to sterilize glass equipment? Who would be your supplier of such non-disposeables? Address that problem in your planning, and initiate discussions with suppliers, to ascertain the production realities and alternatives in the medical plastics industry.

There are limits any society can devote to medical care. We have reached that limit, says Berg, and with it "the serious and soul wrenching decisions that have to be made." Limited resources for health services are already drawing headlines. The Secretary of DHHS announced on June 12 that the Medicare program will temporarily halt reimbursement payments for heart transplants, and that a 2-year, $2 million study will help the government decide on the "medical, social, economic, and ethical consequences" of this expensive technology. This fall, the Department of Health and Human Services will announce rules requiring that all major new medical technology be justified on the basis of "safety, efficiency, and social consequences" before being eligible for tax-refund reimbursements. Because of these limits, the '80s may well highlight preventative health care and consumer health education.

Rich Maturi, Energy Project Director from Blue Cross/Blue Shield's program development area, spoke on the impact of energy futures on BC/BS plan subscribers, and the current and future challenges to the organization in the energy area.

Blue Cross/Blue Shield shares the concerns of others in the health fields on the impact of rising energy prices on health care costs. Maturi translated those increased health care costs into dollars, by pointing out that in 1979, Plan subscribers paid roughly $150 million nationwide in extra health care costs attributed solely to increased energy costs. Every 1 percent increase in fuel and utility costs in 1980, will cost the Plans $2.5 million in the mid-west region, and $7.5 million nationwide, in increased health care costs. And, said Maturi, those increases are only direct fuel costs, and can not reflect rising energy costs on supplier or construction increases.

The second major concern of the Plans is that energy disruptions threaten their basic mission of assuring access to quality care for 83 million subscribers nationwide.

To date, BC/BS activities in energy have focused on energy conservation in hospitals. Starting in 1975, the Blue Cross of Greater Philadelphia, sponsored a pilot energy audit program with six of its member hospitals. That beginning identified energy conservation measures that could save 10 percent of the energy consumption of the participating hospitals. In 1976, the same Plan helped organize and provide financial incentives for the first large scale hospital energy audit program, identifying $6.5 million in annual energy savings that could be achieved by the 58 participating hospitals without requiring any capital investments. More important, that early program clearly demonstrated the feasibility of group hospital energy audit programs, and the feasibility of Blue Cross involvement. In 1978, the Blue Cross/Blue Shield association initiated an energy project as part of the national cooperative effort with the Hospital Research and Education Trust of the American Hospital Association, and the Hospital Association of New York State. That project is providing Plans with ongoing information to help them evaluate energy issues, and technical consultation and assistance to help Plans implement programs and activities to support energy management.

Since 1978, says Maturi, 21 Plans have initiated special

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efforts for hospital energy management. That represents 30 percent of Blue Cross organizations nationwide, and about 20-25 percent of the contracting hospitals, with a higher percentage of contracting beds.

Maturi outlined several category areas in which the BC/BS has been involved in energy management, with specific examples of certain Plan activities:

Educational Efforts: In Michigan, BC/BS conducted a series of seminars throughout the State to help member hospitals become more aware of the need for the resources available to support hospital energy conservation. The Plan also worked with the Michigan Energy Office, the Michigan Hospital Association, and the health planning agencies to help insure that the State energy plan would be effective.

Organized Energy Audit Programs: Blue Cross of northeast Ohio worked with the greater Cleveland Hospital Association to develop a group energy audit, and technical assistance program for 26 hospitals.

Financial arrangements: 20 Plans have used a variety of financial arrangements to stimulate hospital participation in energy audits. Blue Cross of northeast Ohio, and recently Blue Cross of northwest Ohio, have offered hospitals an incentive payment, equal to the cost of an energy audit. Normally such costs would not be covered by third party payers.

The BC/BS organization also works with hospital association energy management programs by sharing information and providing direct financial support. Maturi said experiences derived from these cooperative efforts point out three benefits: (1) Immediate and significant energy costs avoidance can be achieved; (2) Member health care institutions, including the Plans, become organizationally geared up to better address a variety of energy issues in the future; and (3) Organized energy audit and technical assistance programs can provide important data to serve as a technical basis for future energy planning. A dozen plans around the nation are currently investigating activities in this area.

Maturi concluded his comments by saying that "BC/BS organizations recognize that our subscribers are placed in jeopardy by the problems of rapidly rising energy costs and increasingly insecure energy supply...We have taken initial steps to try to carve out roles for ourselves in this area by helping hospitals increase energy efficiency. It is also clear that there are roles BC/BS can continue to play in areas that have yet to be developed, and in some cases, yet to be identified."

The final half of the day of the conference was devoted to 4 concurrent workgroup sessions which reported their thoughts and recommendations to the reassembled conference. The following are brief highlights of those reports:

Workgroup #1

This group developed a scenario for addressing contingency planning. First, review energy uses to learn where you are at the moment. Energy uses review would include knowing cost of energy by type, units of energy by type, inventory of energy using equipment. Find out what could be shut down, and develop a shut-down option chart.

This proposed shut-down schedule must be reviewed with the hospital management, and a steering committee formed of representatives from technical and medical staff, volunteers, and board members. They should review and approve alternatives, since they are the ones to implement the plan and market it.

Develop engineering and operations options. Define vital and nonvital patient support services and list them.

In developing such a plan, the facility must be aware that it does not stand alone. Develop a community energy committee which identifies community health needs, alternative energy sources, and transportation needs.

Workgroup #2

Short term contingencies, resulting, for example, from natural disasters, should be planned for by using the following:

- test emergency generation capabilities regularly;
- adopt short-term generating capabilities;
- consider dual firing capability, including the potential problems with fire codes;
- investigate bariers caused by codes and regulations.

Internally, plan for energy reduction schemes for various levels of shortage, and shut down plans for services. Such considerations would include potential staff cutbacks, emergency food supply for cold preparation.

Long-term shortage planning must start now with energy conservations, and work to change codes and standards. Specifically, the work group said such standards to be considered for change would include: ventilation; State lighting requirements; hot water levels for domestic and laundry use; and examining life safety requirements.

Stressing a point made in the first report, this workgroup also pointed out the necessity for considering the community outside the health care facility. They recommended development of the community master plan, to include an inventory of facilities and services; coordinated procedures, responsibilities, and authority lines for facilities, public agencies, and voluntary agencies; plans to share services, and coordination of transportation services and coordination of fuel suppliers. In addition, they stressed the importance of the community plan as a tool to educate community leaders on the need for contingency planning.

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The group also called for government support in education, finances, and revised codes and standards. They further recommended that there be an immediate inclusion of capital expenditures for energy management in current reimbursement programs.

Workgroup #3

This group addressed the specifics of creating needed changes in local, State, and Federal regulations and attitudes. The group recommended involving elected officials, addressing the preceived lack of information and communication systems in energy management and health, identifying technical assistance and marketing that information, and addressing the need for changed standards and reimbursement procedures.

In order to market the need for change, you need to establish information and communication systems. Base those systems on "common sense" terms. Find out what technical assistance in health and energy planning exists, and how it can be made available. Determine then, who will take on that education role. Suggestions from the group were: ASHRE, AIA. To market that information, for both technical information exchange and to change political attitudes, you need to have something with which people can clearly identify. An example suggested was to develop, within regional areas, *role model* facilities which would be chosen to exemplify engineering and energy conservation achievements. That information should be disseminated through journals and organizations. A suggestion was made that such information exchange could start with the conference attendees; participants should be polled one year from now on the specific energy contingency planning achievements they have initiated or observed, and those results should be communicated to all those who have attended the series of conferences.

The group also recommended that changes be made in the current reimbursement system to create disincentives—a facility which does nothing will not have increased rate changes recognized for reimbursement.

Workgroup #4

This group addressed the impact of fuel reductions on health care system operations, both from short and long term standpoints. Many suggestions were mentioned in preceeding group recommendations, but this group added that the work week be revised (longer working hours, fewer days), with corresponding reassignment of jobs. Inventories should be increased. Facilities should consider establishing employee sleeping quarters. Dual fuel capabilities should be considered and implemented.

In the long-term, heat recovery, shared services, and community involvement, and alternate sources of energy must be considered.

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